CLAIMS

1. A bovine adenovirus vector comprising a modification in a polynucleotide encoding a capsid protein, or fragment thereof, wherein said capsid protein, or fragment thereof, is associated with tropism and wherein said modification is associated with altered tropism.

2. The adenovirus vector of claim 1 wherein said polynucleotide encoding a capsid protein, or fragment thereof, is replaced with a polynucleotide encoding a heterologous mammalian capsid protein, or fragment thereof.

3. The adenovirus vector of claim 1 wherein said capsid protein, or fragment thereof, is a penton protein, or fragment thereof.

4. The adenovirus vector of claim 1 wherein said capsid protein, or fragment thereof, is a hexon protein, or fragment thereof.

5. The adenovirus vector of claim 1 wherein said capsid protein, or fragment thereof, is a fiber protein, or fragment thereof.

6. The adenovirus vector of claim 5 wherein the modification is in the knob region of a fiber protein.

7. The adenovirus vector of claim 3 wherein said bovine adenovirus penton region, or fragment thereof, is replaced with at least one heterologous mammalian penton adenovirus region, or fragment thereof.

8. The adenovirus vector of claim 4 wherein said bovine adenovirus hexon region, or fragment thereof, is replaced with at least one heterologous mammalian adenovirus hexon region, or fragment thereof.

9. The adenovirus vector of claim 5 wherein said bovine adenovirus fiber region, or fragment thereof, is replaced with at least one heterologous mammalian adenovirus fiber region or fragment thereof.

10. The adenovirus vector of claim 2 wherein said heterologous mammalian adenovirus capsid protein, or fragment thereof, includes porcine, ovine, canine or human adenovirus capsid protein, or fragment thereof.

11. The adenovirus vector of claim 10 wherein said heterologous mammalian adenovirus capsid protein, or fragment thereof, is a human adenovirus capsid protein, or fragment thereof.

12. The adenovirus vector of claim 1 wherein said adenovirus is a sub-type 1 adenovirus.

13. The adenovirus vector of claim 1 wherein said adenovirus is a sub-type 2 adenovirus.

14. The adenovirus vector of claim 12 wherein said adenovirus vector is BAV3.

15. The adenovirus vector of claim 14 wherein said modification is a replacement of BAV3 fiber protein, or fragment thereof, with a heterologous mammalian adenovirus fiber protein, or fragment thereof.

16. The adenovirus vector of claim 15 wherein said mammalian adenovirus fiber protein includes bovine, porcine, ovine, canine or human adenovirus fiber protein.

17. The adenovirus vector of claim 16 wherein said mammalian adenovirus fiber protein is a human adenovirus fiber protein.

18. The adenovirus vector of claim 1 wherein said vector lacks E1 function.

19. The adenovirus vector of claim 18 wherein said vector has a deletion of part or all of the E1 gene region.

20. The adenovirus vector of claim 1 wherein said vector has a deletion of part or all of the E3 gene region.

21. The adenovirus vector of claim 1 wherein said vector further comprises a polynucleotide encoding a heterologous protein.

22. The adenovirus vector of claim 21 wherein said heterologous protein includes cytokines; lymphokines; membrane receptors recognized by pathogenic organisms, dystrophins; insulin; proteins participating in cellular ion channels; antisense RNAs; proteins capable of inhibiting the activity of a protein produced by a pathogenic gene, a protein inhibiting an enzyme activity, protein variants of pathogenic proteins; antigenic epitopes; major histocompatibility complex classes I and II proteins; antibodies; immunotoxins; toxins; growth factors or growth hormones; cell receptors or their ligands; tumor suppressors; cellular enzymes; or suicide genes.

23. The adenovirus of claim 22 wherein said polynucleotide encoding said heterologous protein is inserted in the adenovirus E1 gene region.

24. The adenovirus of claim 22 wherein said polynucleotide encoding said heterologous protein is inserted in the adenovirus E3 gene region.

25. The adenovirus vector of claim 1 wherein said vector is replication-competent.

26. The adenovirus vector of claim 1 wherein said vector is replication-defective.

27. A host cell comprising the bovine adenovirus vector of claim 1.

28. A host cell comprising the bovine adenovirus vector of claim 21.

29. A method of producing a recombinant bovine adenovirus vector comprising a modification in a polynucleotide encoding a capsid protein, or a fragment thereof, comprising the steps of, obtaining a bovine adenovirus vector; and introducing a modification into a polynucleotide encoding a capsid protein, or fragment thereof, wherein said capsid protein, or fragment thereof, is associated with tropism and wherein said modification is associated with altered tropism.

30. The method of claim 29 wherein said capsid protein, or fragment thereof, is a penton protein, or fragment thereof.

31. The method of claim 29 wherein said capsid protein, or fragment thereof, is a hexon protein, or fragment thereof.

32. The method of claim 29 wherein said capsid protein, or fragment thereof, is a fiber protein, or fragment thereof.

33. The method of claim 29 wherein said adenovirus vector further comprises a polynucleotide encoding a heterologous protein.

34. The method of claim 29 wherein said bovine adenovirus is a sub-type 1 bovine adenovirus.

35. A recombinant bovine adenovirus comprising a modification in a polynucleotide encoding a capsid protein, or fragment thereof, wherein said capsid protein, or fragment thereof, is associated with tropism and wherein said modification is associated with altered tropism.

36. The recombinant adenovirus of claim 35 further comprising a polynucleotide encoding a heterologous protein.

37. The recombinant adenovirus of claim 36 wherein said polynucleotide encoding said heterologous protein is inserted in the adenovirus E1 gene region.

38. The recombinant adenovirus of claim 36 wherein said polynucleotide encoding said heterologous protein is inserted in the adenovirus E3 gene region.

39. The recombinant adenovirus of claim 35 wherein said capsid protein, or fragment thereof, is a penton protein, or fragment thereof.

40. The recombinant adenovirus of claim 35 wherein said capsid protein, or fragment thereof, is a hexon protein, or fragment thereof.

41. The recombinant adenovirus of claim 35 wherein said capsid protein, or fragment thereof, is a fiber protein, or fragment thereof.

42. The recombinant adenovirus of claim 41 wherein the modification is in the knob region of a fiber protein.

43. An immunogenic composition comprising a bovine adenovirus wherein said adenovirus comprises a polynucleotide encoding a modification in a capsid protein, or fragment thereof, and wherein said protein, or fragment thereof, is associated with tropism and wherein said modification is associated with altered tropism.

44. The immunogenic composition of claim 43 wherein said capsid protein is a penton protein, or fragment thereof.

45. The immunogenic composition of claim 43 wherein said capsid protein is a hexon protein, or fragment thereof.

46. The immunogenic composition of claim 43 wherein said capsid protein is a fiber protein, or fragment thereof.

47. The immunogenic composition of claim 46 wherein said capsid protein, or fragment thereof, is a knob domain of a fiber protein.

48. The immunogenic composition of claim 43 wherein said modification is a replacement of a bovine fiber protein, or fragment thereof, with a mammalian adenovirus fiber protein, or fragment thereof.

49. The immunogenic composition of claim 48 wherein said mammalian fiber protein is a human adenovirus fiber protein.

50. The immunogenic composition of claim 43 wherein said bovine adenovirus is a sub-type 1 adenovirus.

51. The immunogenic composition of claim 50 wherein said bovine adenovirus is BAV3.

52. The immunogenic composition of claim 43 wherein said bovine adenovirus comprises a polynucleotide encoding a heterologous protein.

53. A pharmaceutical composition capable of inducing an immune response in a mammalian subject, said composition comprising the immunogenic composition of claim 52.

54. The pharmaceutical composition of claim 53 further comprising a pharmaceutically acceptable excipient.

55. A method for eliciting an immune response in a mammalian host to protect against infection, the method comprising administration of the pharmaceutical composition of claim 54.

56. The method of claim 55 wherein said protein includes cytokines; lymphokines; membrane receptors recognized by pathogenic organisms, dystrophins; insulin; proteins participating in cellular ion channels; antisense RNAs; proteins capable of inhibiting the activity of a protein produced by a pathogenic gene, a protein inhibiting an enzyme activity, protein variants of pathogenic proteins; antigenic epitopes; major histocompatibility complex classes I and II proteins; antibodies; immunotoxins; toxins; growth factors or growth hormones; cell receptors or their ligands; tumor suppressors; cellular enzymes; or suicide genes.

57. A method of gene delivery in a mammalian host, the method comprising administering to the host a bovine adenovirus vector comprising a polynucleotide encoding a modified capsid protein, or fragment thereof, wherein the protein is associated with tropism and wherein the modification is associated with altered tropism and wherein the adenovirus vector further comprises a polynucleotide encoding a heterologous protein.

58. The method of claim 57 wherein said heterologous polynucleotide encodes a therapeutic protein.

59. The method of claim 57 wherein said capsid protein, or fragment thereof, is a penton protein, or fragment thereof.

60. The method of claim 57 wherein said capsid protein, or fragment thereof, is a hexon protein, or fragment thereof.

61. The method of claim 57 wherein said capsid protein, or fragment thereof, is a fiber protein, or fragment thereof.

62. The method of claim 61 wherein the modification is in the knob region of a fiber protein.

63. The method of claim 57 wherein said mammalian host is human and said modification is a replacement of a bovine adenovirus fiber protein, or fragment thereof, with a human fiber protein, or fragment thereof.